Volunteer Lake Assessment Program Individual Lake Reports

WAUKEENA LAKE, DANBURY, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	282	**Max. Depth (m):**	6.1	**Flushing Rate (yr^{-1}):**	2.5
Surface Area (Ac.):	53	**Mean Depth (m):**	1.2	**P Retention Coef:**	0.74
Shore Length (m):	2,400	**Volume (m^3):**	276,500	**Elevation (ft):**	1116

TROPHIC CLASSIFICATION

Year	Trophic class
1983	MESOTROPHIC
2002	MESOTROPHIC

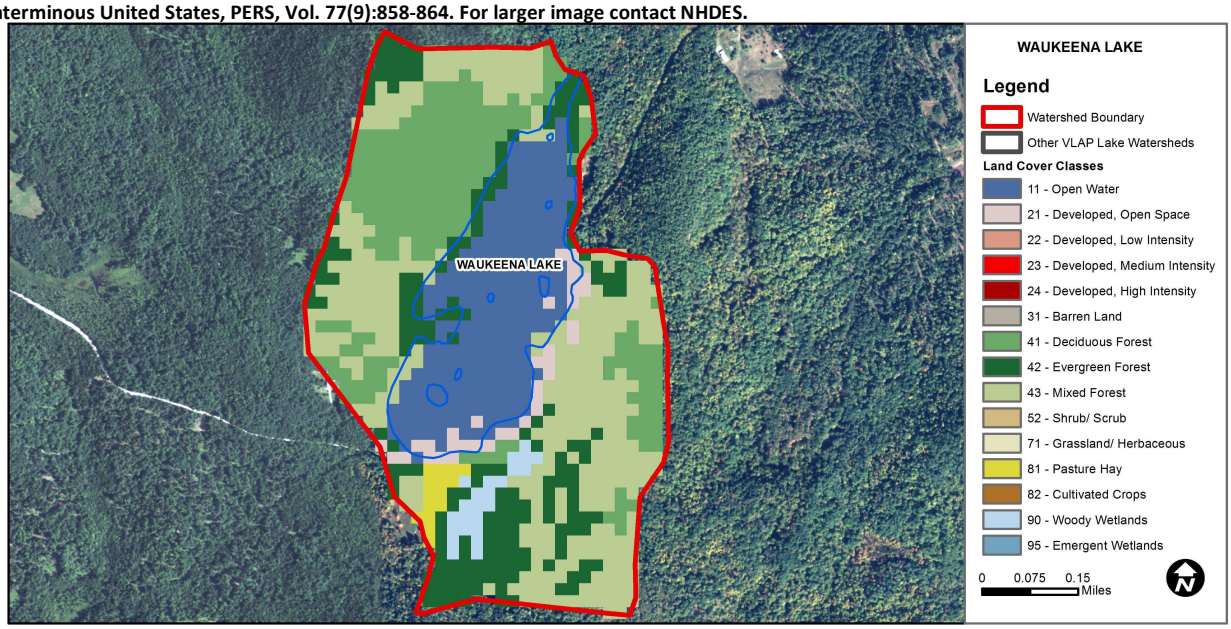
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	21	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	3.33	Deciduous Forest	21.05	Pasture Hay	1.43
Developed-Low Intensity	0	Evergreen Forest	18.19	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	32.96	Woody Wetlands	2.29
Developed-High Intensity	0	Shrub-Scrub	0	Emergent Wetlands	0

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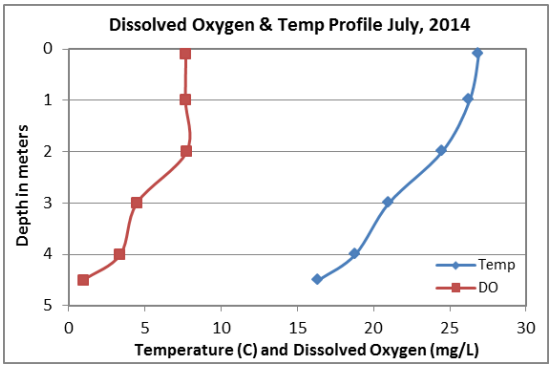
Waukeena Lake, Danbury

2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels measured in July did not meet duplicate acceptance criteria. Therefore, the data were invalid and not utilized in 2014 reporting.
- **Conductivity/Chloride:** Epilimnetic (upper water layer) conductivity levels were the lowest measured since monitoring began and well below the state median. Historical trend analysis indicates highly variable epilimnetic conductivity since monitoring began. Hypolimnetic (lower water layer) and Outlet conductivity levels were also low.
- **Total Phosphorus:** Epilimnetic and hypolimnetic phosphorus levels were average and slightly less than the state medians. However, epilimnetic phosphorus increased from that measured in 2012 and 2013. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Outlet phosphorus was low in July.
- **Transparency:** Transparency was slightly less than the state median and was the lowest (worst) measured since monitoring began. Historical trend analysis indicates stable transparency since monitoring began.
- **Turbidity:** Epilimnetic, Hypolimnetic and Outlet turbidities were slightly elevated in July. Algal growth and low water levels may have contributed to the higher turbidities.
- **pH:** Epilimnetic and Outlet pH levels were within the desirable range 6.5-8.0 units, however Hypolimnetic pH was less than the desirable range, and historical epilimnetic pH levels have also been less than desirable. Historical trend analysis indicates relatively stable epilimnetic pH since monitoring began.
- **Recommended Actions:** Overall, water quality has varied between years. Increase monitoring frequency to three times per summer, typically June, July and August, to better assess seasonal and historical water quality trends and decrease data variability. The increased frequency and intensity of storm events and resulting stormwater runoff highlights the importance of managing stormwater runoff within the watershed. DES' "NH Homeowner's Guide to Stormwater Management" is a great resource lake and watershed residents. Keep up the great work!



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: > 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: between 6.5-8.0 (unless naturally occurring)

Station Name	Table 1. 2014 Average Water Quality Data for WAUKEENA LAKE						
	Alk. mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
				NVS	VS		
Epilimnion	3.7	12.3	10	2.50	2.90	1.41	6.55
Hypolimnion		25.4	12			1.83	6.09
Outlet		24.0	9			1.32	6.57

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m^3

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 m

pH: 6.6

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.